NOISE TECHNICAL MEMORANDUM

Date: September 26, 2018

To: Phil Crocker – UM Upper Chesapeake Health

From: Mike Alberts, KB Environmental Sciences, Inc.

Subject: Helipad Noise Analysis

Introduction

This noise technical memorandum provides the results of noise assessment that was performed for a proposed hospital helipad site in Aberdeen, MD. The noise assessment was prepared to provide typical helicopter sound levels expected in the residential areas closest to the site.

Sound Definitions

Sound is energy transmitted by pressure waves through a medium such as air. Noise is defined as unwanted sound. The decibel (dB) is a unit used to describe sound pressure levesl. With A-weighting (dBA), sound levels approximate the sensitivity of the human ear to sounds of different frequencies. When expressed in dBA, the sound has been filtered to reduce the effect of very low and very high frequency sounds, much as the human ear filters sound frequencies.

The highest A-weighted sound level during a single event in which the sound changes with time is called the Maximum Sound Level (Lmax).

Noise Sources

Transportation sources, such as automobiles, trucks, trains, and aircraft, are the principal sources of noise in an urban environment. Along major transportation corridors, noise levels can reach 80 dBA, while along arterial streets, noise levels typically range from 65 to 70 dBA. Some common indoor and outdoor activity sound levels on the dBA scale are listed in Table 1.

Human Response to Noise

Human response to noise varies considerably from one individual to another. There is no completely satisfactory way to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction. A wide variation exists in the individual thresholds of annoyance, and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Table 1
Typical Sound Levels

Common Outdoor Activities	Sound Level dBA	Common Indoor Activities
	----110----	Rock band
Jet flyover at 1,000 feet		
	----100----	
Gas lawnmower at 3 feet		
	----90----	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	----80----	Garbage disposal at 3 feet
Noisy urban area daytime		
Gas lawnmower at 100 feet	**----70----**	Vacuum cleaner at 10 feet
		Normal speech at 3 feet
Heavy traffic at 300 feet	**----60----**	
		Large business office
Quiet urban daytime	**----50----**	Dishwasher in next room
		Theater, large conference room
Quiet urban nighttime	**----40----**	(background)
Quiet suburban nighttime		
	----30----	Library
Quiet rural nighttime		Bedroom at night (background)
	----20----	

Helicopter Noise Levels

For the purpose of determining the noise levels that would result from the operations at the helipad, a noise analysis was performed using the Federal Aviation Administration (FAA) Aviation Environmental Design Tool (AEDT) Version 2d. The AEDT is the FAA- approved noise model for quantifying aircraft (including helicopter) noise. While the proposed helipad is not a federal action, the guidance contained in FAA documents is considered to be the industry standard for performing aircraft noise analyses.

Based in information from similar facilities, it is expected that the proposed helipad will support an average of one helicopter flight per day. Typical helicopter models that serve this type of facility include the Eurocopter EC145 and the AgustaWestland AW139. At this site, the helicopters would generally be arriving from the south and departing to the west. These paths avoid directly overflying the closest residential properties located east of the helipad along Graceford Dr. The AEDT modeling indicates that the EC145 and AW139 would generate Lmax decibel levels at these homes ranging from the upper 70's to low 80's. These properties would experience these levels on

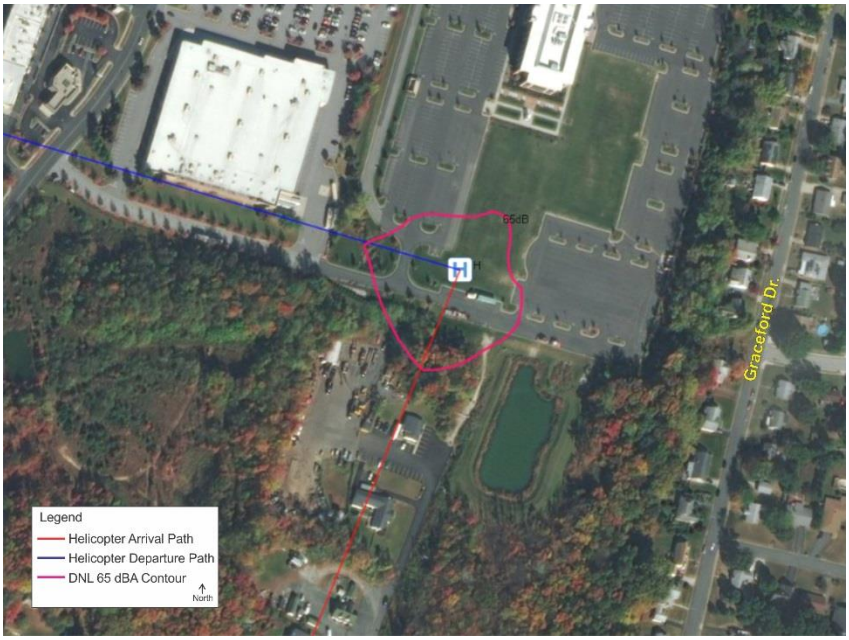
average once a day for a duration of up to a few minutes. It should be noted that these decibel levels are outdoor/exterior levels. Typical home construction reduces noise levels by 15- 20 decibels – so interior noise levels in these homes would generally range between 60 and 70 decibels.

DNL Noise Contours

In addition to Lmax single event noise levels, federal guidelines regarding the compatibility of land uses and aircraft noise levels are expressed in terms of the Day-Night Average Sound Level (DNL). The DNL represents average noise levels over a 24-hour period. In the calculation of DNL, sound events occurring during the nighttime (10:00 P.M. to 6:59 A.M.) are increased by a 10-decibel weighting to represent the increased sensitivity of people to noise that occurs at night. Based in information from similar facilities, it is expected that just over 1 flight per week (approximately 5 per month) at this site would occur during these nighttime hours.

DNL the noise descriptor used for aircraft noise exposure and land use compatibility planning. The federal guidelines indicate that all lands are compatible with aircraft noise below the DNL 65 dBA. The DNL 65 dBA contour from helicopter operations at the proposed helipad were modeled using the AEDT and is shown on Figure 1. While the contour largely remains within the hospital property boundary, a portion does extend off-property but does not encompass any residental properties.

Figure 1
DNL 65 dBA Noise Contour



Source: KB Environmental Sciences, Inc., 2018.